

REMARKS

The foregoing claim amendments amend claims 1, 2, 11, 13, 14, 21, 23, 26, 31, 34 and 35, cancel claims 3-10, 16, 18, 20, 27-30, 32, 33, 36 and 37, and adds claims 38-43. Pending in the application are claims 1, 2, 11-15, 17, 19, 21-26, 31, 34, 35 and 38-43, of which claims 1, 13, 23, 26, 31, 34, 38, 39 and 40 are independent. The following comments address all stated grounds for rejection and place the presently pending claims, as identified above, in condition for allowance.

Patentable Subject Matter

Claims 31, 34 and 35 are indicated to recite patentable matter and would be allowable if rewritten in independent form. In the foregoing claim amendment, Applicants amend claims 31 and 34 in independent form and amend claim 35 to depend from rewritten independent claim 34. Applicants respectfully request that the Examiner pass these claims to issuance.

Claim Amendments

Applicants amend claims 1, 2, 11, 13, 14, 21, 23, 26, 31, 34 and 35 to clarify the scope of the claimed invention. In particular, independent claims 1, 13 and 26 are amended to recite that a warming-up of a fuel cell is carried out *at the time of starting the fuel cell and when the fuel cell temperature is lower than a prescribed level*. Support for the claim amendments can be found in other claims, such as claim 23, and throughout the Specification. No new matter is added.

Claim Suggestions

The Examiner suggests amending claim 35 to depend from claim 34. In the foregoing claim amendments, Applicants amend claim 35 as suggested by the Examiner. Applicants respectfully request that the Examiner reconsider and withdraw the present rejections.

Claim Objections

The Examiner objects to claims 11 and 13 for certain informalities. In response to the objections, Applicants amend claims 11 and 13 to cure the informalities. In light of the claim amendments, Applicants respectfully request that the Examiner withdraw the present objections and pass claims 11 and 13 to issuance.

Claim Rejections - 35 U.S.C. §112

The Examiner rejects claims 23-25 as failing to comply with the written description requirement. The Examiner notes that there is no disclosure of a temperature measurement of the fuel cell *per se* or a temperature measurement of any part within the fuel cell.

In response to the rejections, Applicants submit that there is a disclosure in the Specification that the supply gas at the inlet of a fuel cell and the exhaust gas at the outlet of a fuel cell are measured. Those of ordinary skill in the art will appreciate that the temperature of the fuel cell can be determined from the inlet temperature and the outlet temperature of the fuel cell. Consequently, Applicants consider that claims 23-25 are supported by the Specification. Accordingly, Applicants respectfully urge the Examiner to reconsider and withdraw the present rejections.

Claim Rejections - 35 U.S.C. §102

Rejections of Claims 1, 3 and 37

The Examiner rejects claims 1, 3 and 37 under 35 U.S.C. 102(b) as being anticipated by Strasser (U.S. Patent Number 5,543,238). Applicants respectfully traverse the rejection in light of the following reasons.

Amended claim 1 recites warming-up a fuel cell by returning heated exhaust gas at the time of starting-up the fuel cell and when the temperature of the fuel cell is lower than a prescribed level. Claims 3 and 37 are canceled.

Applicants respectfully submit that cited reference fails to disclose each and every element of claim 1. Applicants submit that Strasser does not disclose warming-up the fuel cell *at the time of starting-up the fuel cell and when the temperature of the fuel cell is lower*

than a prescribed level, as recited in amended claim 1. The Strasser reference discloses an apparatus in which a humidified exhaust gas is returned to a fuel cell for the purpose of humidification.

In contrast, a heated exhaust gas, for example, adiabatically heated by a compressor is returned to a fuel cell in the claimed invention for the purpose of warming up the fuel cell during fuel cell start up, and when the temperature of the fuel cell is lower than a prescribed level. Strasser does not disclose the warming-up conditions of the fuel cell recited in the claimed invention. In Strasser, the humidified exhaust gas is returned to a fuel cell for the purpose of the humidification during operation of the fuel cell. The Strasser reference does not disclose returning the exhaust gas to the supply gas depending upon a warm-up condition upon start-up (or warming up) of the fuel cell, such that a temperature of the fuel cell is lower than a prescribed level (e.g., normal operating temperatures).

In light of the aforementioned claim amendments and arguments, Applicants submit that the Strasser reference fails to disclose each and every element of claim 1. Applicants therefore request the Examiner withdraw the rejection of claim 1 and pass claim 1 to allowance.

Rejections of Claims 1, 2, 23 and 26-28

The Examiner rejects claims 1, 2, 23 and 26-28 under 35 U.S.C. 102(b) as being anticipated by JP 58-164157. Applicants respectfully traverse the rejection for the following reasons.

Independent claims 1, 23 and 26 recites warming up the fuel cell by returning the heated exhaust gas *at the time of starting-up the fuel cell and when the temperature of the fuel cell is lower than a prescribed level*. Claim 2 depends from claim 1. Claims 27 and 28 are canceled.

Applicants respectfully submit that the cited reference fails to disclose each and every element of claims 1, 23 and 26. Applicants submit that JP 58-164157 does not disclose warming up the fuel cell at the time of starting-up the fuel cell and when the temperature of the fuel cell is lower than a prescribed level, as recited claims 1, 23 and 26. The JP 58-

164157 reference discloses an apparatus that includes a valve controlled by a controller responsive to the temperature of exhaust gas. The JP 58-164157 reference provides for *cooling down a fuel cell* using the controlling valve. In contrast, the claimed invention provides for *warming up a fuel cell* using a heat exchanger.

JP 58-164157 discloses an air-cooling type fuel cell in which a fuel cell is cooled down by exhaust gas and a large quantity of air (fresh air). (See, page 2, last paragraph in upper light column). JP 58-164157 discloses that a fuel cell is cooled down by detecting the temperature of the exhaust gas, and controlling the amount of the exhaust gas to be returned to the fuel cell and the amount of fresh air to be supplied to the fuel cell. The cooling down of a fuel cell depending on the temperature of the exhaust gas disclosed in JP 58-164157 does not correspond to the warming-up of a fuel cell recited in the claimed invention. JP 58-164157 does not disclose warming up a fuel cell under the conditions recited in the claimed invention.

In light of the aforementioned claim amendments and arguments, Applicants submit that the JP 58-164157 reference fails to disclose each and every element of claims 1, 23 and 26. Applicants therefore request the Examiner withdraw the rejection of claim 1, 2, 23 and 26 and pass the claims to allowance.

Rejections of Claims 1, 11, 12 and 20

The Examiner rejects claims 1, 11, 12 and 20 under 35 U.S.C. 102(b) as being anticipated by JP 62-219472. Applicants respectfully traverse the rejection in light of the following reasons.

Claims 11 and 12 depend from claim 1. Claim 20 is canceled.

Applicants respectfully submit that cited reference fails to disclose each and every element of claim 1. Applicants submit that JP 62-219472 does not disclose warming up the fuel cell at the time of starting-up the fuel cell and when the temperature of the fuel cell is lower than a prescribed level, as recited claim 1. The JP 62-219472 reference discloses a system generating stable electricity by controlling the flow rate of recycling, depending on the quantity of electric load. JP 62-219472 discloses that the system includes a valve for

returning exhaust gas to supply gas. However, JP 62-219472 does not disclose warming up the fuel cell at the starting-up of the fuel cell and when the temperature of the fuel cell is lower than a prescribed level, which is recited as the warming-up condition of the fuel cell in claim 1.

In light of the aforementioned claim amendments and arguments, Applicants submit that the JP 62-219472 reference fails to disclose each and every element of claim 1. Applicants therefore request the Examiner withdraw the rejections of claim 1, 11 and 12, and pass the claims to allowance.

Rejections of Claims 1, 3, 13, 15, 20, 22-25 and 37

The Examiner rejects claims 1, 3, 13, 15, 20, 22-25 and 37 under 35 U.S.C. 102(e) as being anticipated by JP 2000-195533. Applicants respectfully traverse the rejection in light of the following reasons.

Since JP 2000-195533 is a Japanese patent application (a non-US publication) and there is no indication that a corresponding application has been filed with the United States Patent and Trademark Office, Applicants submit that the JP 2000-195533 does not qualify as a reference under 35 U.S.C. 102(e). Applicants, however, will for purposes of this Response that the Examiner rejects claims 1, 3, 13, 15, 20, 22-25 and 37 under 35 U.S.C. 102(a) as being anticipated by JP 2000-195533. In this respect, Applicants will submit an English translation of the corresponding Japanese priority patent application to remove this publication as a reference. By relying on the filing date of the corresponding Japanese application, Applicants submit that the priority date of the Applicants' patent application antedates the publication date of the JP 2000-195533 reference. Applicants therefore request that the Examiner reconsider and withdraw the present rejection of claims 3, 13, 15, 20, 22-25 and 37.

Claim Rejections - 35 U.S.C. §103

Rejections of Claims 3-10, 13, 15, 17, 19, 24, 25, 32, 33, 36 and 37

The Examiner rejects claims 3-10, 13, 15, 17, 19, 24, 25, 32, 33, 36 and 37 under 35 U.S.C. 103(a) as being unpatentable over JP 58-164157 in view of Strasser. Applicants

respectfully traverse the rejection in light of the following reasons.

Claims 3-10, 32, 33, 36 and 37 are canceled. Claims 15, 17, 18 depend upon claim 13 and claims 24 and 24 depend upon claim 23.

Applicants submit that the cited references fail to teach or suggest all of the limitations of the claimed invention. Applicants submit that JP 58-164157 and Strasser, in combination, do not teach warming up the fuel cell at the time of starting-up the fuel cell and when the temperature of the fuel cell is lower than a prescribed level, as recited claims 13 and 23.

JP 58-164157 teaches cooling down a fuel cell using a controlling valve instead of warming up a fuel cell using a heat exchanger. JP 58-164157 teaches that a fuel cell is cooled down by exhaust gas and a large quantity of air (fresh air) during the operation of the fuel cell (under power generation). JP 58-164157 teaches cooling down the fuel cell by detecting the temperature of the exhaust gas, and by controlling the amount of the exhaust gas to be returned to the fuel cell and the amount of fresh air to be supplied to the fuel cell. The JP 58-164157 reference, however, does not teach warming up the fuel cell. Furthermore, JP 58-164157 does not teach warming up the fuel cell under the condition recited in claims 13 and 23.

Strasser teaches a fuel cell in which a humidified exhaust gas is returned to the fuel cell for the purpose of humidification. The Strasser reference does not teach the warming-up conditions of the fuel cell recited in claims 13 and 23.

In light of the aforementioned claim amendments and arguments, Applicants submit that JP 58-164157 and Strasser, in combination, fail to teach or suggest all of the limitations of claims 13 and 23. Claims 15, 17, 19, 24 and 25, which depend upon one of claims 13 and 23, are not rendered obvious over the cited references. Applicants therefore request the Examiner withdraw the rejections of claim 13, 15, 17, 19, 24 and 25 and pass the claims to allowance.

Rejections of Claims 27-29

The Examiner rejects claims 27-29 under 35 U.S.C. 103(a) as being unpatentable over JP 62-219472 in view of JP 58-164157. Applicants cancel claims 27-29 in the aforementioned claim amendments.

Rejections of Claims 21 and 22

The Examiner rejects claims 21 and 22 under 35 U.S.C. 103(a) as being unpatentable over Strasser in view of Voss et al. (U.S. Patent No. 6,106,964). Applicants respectfully traverse the rejection in light of the following reasons.

Claims 21 and 22 depend upon claim 13 and add separate and patentable limitations to claim 13.

Applicants submit that the cited references fail to teach or suggest all of the limitations of the claimed invention. Applicants submit that Strasser and Voss, in combination, do not teach warming up the fuel cell at the time of starting-up the fuel cell and when the temperature of the fuel cell is lower than a prescribed level, as recited claim 13.

The Voss reference is cited to provide teachings for the limitations added in claims 21 and 22. Voss teaches a fuel cell that includes a combined heat and humidity exchanger (CHHE). Voss however does not teach warming up the fuel cell at the time of starting-up the fuel cell and when the temperature of the fuel cell is lower than a prescribed level. Accordingly, Strasser and Voss, in combination, do not teach the warming-up conditions recited in claim 13.

In light of the aforementioned claim amendments and arguments, Applicants submit that the Strasser and Voss, in combination, fail to teach or suggest all of the limitations of claim 13. Claims 21 and 22, which depend upon one of claim 13, are not rendered obvious over the cited references. Applicants therefore request the Examiner withdraw the rejections of claims 21 and 22 and pass the claims to allowance.

Rejections of Claims 14, 16 and 21

The Examiner rejects claims 14, 16 and 21 under 35 U.S.C. 103(a) as being unpatentable over JP 2000-195533 in view of Voss. Applicants respectfully traverse the

rejection in light of the following reasons.

As mentioned above, the JP 2000-195533 reference does not qualify as prior art. As such, Applicants request that the Examiner reconsider and withdraw the present rejection.

Rejections of Claim 18

The Examiner rejects claim 18 under 35 U.S.C. 103(a) as being unpatentable over JP 2000-195533 in view of Voss, and further in view of JP 58-164157. Applicants respectfully traverse the rejection in light of the following reasons.

Applicants submit an English translation of corresponding Japanese application of the pending application and rely on the foreign priority date of the pending application. By relying on the filing date of corresponding Japanese application, Applicants submit that the priority date of the pending application antedates the publication date of the JP 2000-195533 reference. Applicants therefore submit that JP 2000-195533 is not qualified for rejecting claim 8, and request the Examiner withdraw the rejection of claim 8.

New Claims

Claims 38-43 are added to more fully claim the instant invention. Claims 38 and 39 are apparatus claims that parallel allowable method claims 31 and 34. Claims 40-43 are directed to a fuel cell warming-up apparatus that includes a compressor for warming up the fuel cell. The new claims also recite the patentable features discussed above. Accordingly, Applicants submit that the new claims are patentable over the cited prior art references and in condition for allowance.

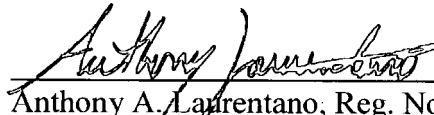
CONCLUSION

For these reasons, Applicants contend that claims 1, 2, 11-15, 17, 19, 21-26, 31, 34, 35 and 38-43 are patentable and that the claims are supported by the disclosure. As such, the Examiner's objections and rejections so far as they are based upon 35 U.S.C. §112, 35 U.S.C. §102 and 35 U.S.C. §103 should be reconsidered and withdrawn. Allowance of the pending claims at an early date is solicited. If, however, the Examiner considers that obstacles to allowance of these claims persist, we invite a telephone call to Applicants' representative.

Respectfully submitted,

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